

AMENDMENTS TO THE CLAIMS:

Set forth below in ascending order, with status identifiers, is a complete listing of all claims currently under examination. Changes to any amended claims are indicated by strikethrough and underlining. This listing also reflects any cancellation and/or addition of claims.

Claim 1 (currently amended)

A multi-component fiber having enhanced reversible thermal properties, comprising:
a fiber body formed from a plurality of elongated members, at least one of the elongated members comprising a polymeric phase change~~temperature regulating~~ material having a transition temperature in the range of 22°C to 40°C dispersed therein.

Claim 2 (currently amended)

The multi-component fiber of claim 1, wherein the transition temperature of the polymeric~~regulating material~~ comprises a phase change material is in the range of 22°C to 28°C.

Claim 3 (currently amended)

The multi-component fiber of claim 12, wherein the polymeric phase change material is selected from the group consisting of polyethylene, polypropylene, polypropylene glycol, polytetramethylene glycol, polypropylene malonate, polyneopentyl glycol sebacate, polypentane glutarate, polyvinyl myristate, polyvinyl stearate, polyvinyl laurate, polyhexadecyl methacrylate, polyoctadecyl methacrylate, polyethylene glycol, polyethylene oxide, and polyesters~~hydrocarbons~~, hydrated salts, waxes, oils, water, fatty acids, fatty acid esters, dibasic acids, dibasic esters, 1 halides, primary alcohols, aromatic compounds, clathrates, semi-clathrates, gas clathrates, stearic anhydride, ethylene carbonate, polyhydric alcohols, polymers, metals, and mixtures thereof.

Claim 4 (currently amended)

The multi-component fiber of claim 12, wherein the at least one of the elongated members comprises from 10 percent to 90 percent of a total weight of the multi-component fiber~~temperature regulating material~~ further comprises a plurality of microcapsules that contain the phase change material.

Claim 5 (currently amended)

The multi-component fiber of claim 12, wherein the at least one of the elongated members comprises from 5 percent to 70 percent by weight of the polymeric phase change temperature regulating material further comprises silica particles, zeolite particles, carbon particles, or an absorbent material impregnated with the phase change material.

Claim 6 (original)

The multi-component fiber of claim 1, wherein the elongated members are arranged in an island-in-sea configuration, a segmented-pie configuration, a core-sheath configuration, a side-by-side configuration, or a striped configuration.

Claim 7 (original)

The multi-component fiber of claim 1, wherein a cross sectional shape of the fiber body is circular, multi-lobal, octagonal, oval, pentagonal, rectangular, square-shaped, trapezoidal, or triangular.

Claim 8 (original)

The multi-component fiber of claim 1, wherein the fiber body is between 0.1 and 1000 denier.

Claim 9 (original)

The multi-component fiber of claim 1, further comprising an additive dispersed within at least one of the elongated members, wherein the additive is selected from the group consisting of water, surfactants, dispersants, anti-foam agents, antioxidants, thermal stabilizers, light stabilizers, UV stabilizers, microwave absorbing additives, reinforcing fibers, conductive fibers, anti-conductive particles, lubricants, process aids, fire retardants, anti-blocking additives, anti-fogging additives, anti-static additives, anti-microbials, crosslinkers, controlled degradation agents, colorants, pigments, dyes, fluorescent whitening agents, optical brighteners, fillers, coupling agents, reinforcement agents, crystallization agents, nucleation agents, and mixtures thereof.

Claim 10 (currently amended)

A multi-component fiber having enhanced reversible thermal properties, comprising:
a first elongated member comprising a first polymeric material and a first temperature regulating material dispersed within the first polymeric material; and
a second elongated member comprising a second polymeric material and a second temperature regulating material dispersed within the second polymeric material, wherein the second elongated member is joined with the first elongated member.

Claim 11 (currently amended)

The multi-component fiber of claim 10, wherein the first temperature regulating material comprises a phase change material.

Claim 12 (original)

The multi-component fiber of claim 11, wherein the phase change material is a hydrocarbon or a mixture of hydrocarbons.

Claim 13 (currently amended)

The multi-component fiber of claim 11, wherein the first temperature regulating material further comprises a plurality of microcapsules that contain the phase change material.

Claim 14 (original)

The multi-component fiber of claim 13, wherein the first polymeric material has an affinity for the microcapsules to facilitate dispersing the microcapsules within the first polymeric material.

Claim 15 (currently amended)

The multi-component fiber of claim 11, wherein the phase change material has a transition temperature in the range of 22°C to 40°C ~~regulating material is a first temperature regulating material, and wherein the second elongated member further comprises a second temperature regulating material dispersed within the second polymeric material~~.

Claim 16 (currently amended)

The multi-component fiber of claim 1015, wherein the first temperature regulating material and the second temperature regulating material are different.

Claim 17 (original)

The multi-component fiber of claim 10, wherein the first polymeric material and the second polymeric material are independently selected from the group consisting of polyamides, polyamines, polyimides, polyacrylics, polycarbonates, polydienes, polyepoxides, polyesters, polyethers, polyfluorocarbons, formaldehyde polymers, natural polymers, polyolefins, polyphenylenes, silicon containing polymers, polyurethanes, polyvinyls, polyacetals, polyarylates, copolymers, and mixtures thereof.

Claim 18 (original)

The multi-component fiber of claim 10, wherein the first polymeric material comprises polyethylene-co-vinyl acetate having between 5 percent and 90 percent by weight of vinyl acetate.

Claim 19 (original)

The multi-component fiber of claim 10, wherein the first elongated member is surrounded by the second elongated member.

Claim 20 (original)

The multi-component fiber of claim 19, wherein the first elongated member is positioned within and completely surrounded by the second elongated member.

Claim 21 (original)

The multi-component fiber of claim 10, wherein the first elongated member comprises from 10 percent to 90 percent of a total weight of the multi-component fiber.

Claim 22 (original)

The multi-component fiber of claim 10, wherein the multi-component fiber is between 0.1 and 1000 denier.

Claim 23 (original)

The multi-component fiber of claim 10, further comprising an additive dispersed within at least one of the first polymeric material and the second polymeric material, wherein the additive is selected from the group consisting of water, surfactants, dispersants, anti-foam agents, antioxidants, thermal stabilizers, light stabilizers, UV stabilizers, microwave absorbing additives, reinforcing fibers, conductive fibers, conductive particles, lubricants, process aids, fire retardants, anti-blocking additives, anti-fogging additives, anti-static additives, anti-microbials, crosslinkers, controlled degradation agents, colorants, pigments, dyes, fluorescent whitening agents, optical brighteners, fillers, coupling agents, reinforcement agents, crystallization agents, nucleation agents, and mixtures thereof.

Claim 24 (currently amended)

A multi-component fiber having enhanced reversible thermal properties, comprising:
a core member comprising a temperature regulating material dispersed therein, wherein the temperature regulating material comprises a phase change material having a transition temperature in the range of -5°C to 125°C and a plurality of microcapsules that contain the phase change material; and

a sheath member surrounding the core member.

Claim 25 (currently amended)

The multi-component fiber of claim 24, wherein the transition temperature of the regulating material comprises a phase change material is in the range of 22°C to 40°C.

Claim 26 (currently amended)

The multi-component fiber of claim 2425, wherein the phase change material is selected from the group consisting of hydrocarbons, hydrated salts, waxes, oils, water, fatty acids, fatty

acid esters, dibasic acids, dibasic esters, 1-halides, primary alcohols, aromatic compounds, clathrates, semi-clathrates, gas clathrates, stearic anhydride, ethylene carbonate, polyhydric alcohols, polymers, metals, and mixtures thereof.

Claim 27 (currently amended)

The multi-component fiber of claim 2425, wherein the phase change material is a paraffinic hydrocarbon having from 13 to 28 carbon atoms~~polymeric phase change material~~.

Claim 28 (currently amended)

The multi-component fiber of claim 2425, wherein the core member further comprises a first polymeric material, wherein the temperature regulating material is dispersed within the first polymeric material, and wherein the sheath member comprises a second polymeric material.

Claim 29 (currently amended)

The multi-component fiber of claim 28, wherein the core member comprises from 10 percent to 30 percent by weight of the temperature regulating material ~~further comprises a containment structure that contains the phase change material, and wherein the containment structure comprises microcapsules, silica particles, zeolite particles, carbon particles, or an absorbent material.~~

Claim 30 (currently amended)

The multi-component fiber of claim 28, wherein the first polymeric material has an ~~a~~ partial affinity for the microcapsules~~phase change material~~, and wherein the second polymeric material encloses the phase change material within the core member and provides a desired physical property to the multi-component fiber.

Claim 31 (original)

The multi-component fiber of claim 28, wherein the temperature regulating material is a first temperature regulating material, and wherein the sheath member further comprises a second temperature regulating material dispersed within the second polymeric material.

Claim 32 (original)

The multi-component fiber of claim 31, wherein the first temperature regulating material and the second temperature regulating material are different.

Claim 33 (original)

The multi-component fiber of claim 28, wherein the first polymeric material and the second polymeric material are independently selected from the group consisting of polyamides, polyamines, polyimides, polyacrylics, polycarbonates, polydienes, polyepoxides, polyesters, polyethers, polyfluorocarbons, formaldehyde polymers, natural polymers, polyolefins, polyphenylenes, silicon containing polymers, polyurethanes, polyvinyls, polyacetals, polyarylates, copolymers, and mixtures thereof.

Claim 34 (original)

The multi-component fiber of claim 24, wherein the core member is positioned within and completely surrounded by the sheath member.

Claim 35 (original)

The multi-component fiber of claim 24, wherein the core member is concentrically positioned within the sheath member.

Claim 36 (original)

The multi-component fiber of claim 24, wherein the core member is eccentrically positioned within the sheath member.

Claim 37 (original)

The multi-component fiber of claim 24, wherein a cross sectional shape of the core member is circular, multi-lobal, octagonal, oval, pentagonal, rectangular, square-shaped, trapezoidal, triangular, or wedge-shaped.

Claim 38 (original)

The multi-component fiber of claim 24, wherein the multi-component fiber is between 0.1 and 1000 denier.

Claim 39 (original)

The multi-component fiber of claim 24, further comprising an additive dispersed within at least one of the core member and the sheath member, wherein the additive is selected from the group consisting of water, surfactants, dispersants, anti-foam agents, antioxidants, thermal stabilizers, light stabilizers, UV stabilizers, microwave absorbing additives, reinforcing fibers, conductive fibers, conductive particles, lubricants, process aids, fire retardants, anti-blocking additives, anti-fogging additives, anti-static additives, anti-microbials, crosslinkers, controlled degradation agents, colorants, pigments, dyes, fluorescent whitening agents, optical brighteners, fillers, coupling agents, reinforcement agents, crystallization agents, nucleation agents, and mixtures thereof.

Claim 40 (currently amended)

A fiber having enhanced reversible thermal properties, comprising:

at least one inner member extending through substantially the length of the fiber and comprising a blend of a first polymeric material and a temperature regulating material, wherein the temperature regulating material comprises a phase change material having a transition temperature in the range of 22°C to 40°C, and wherein the phase change material is selected from the group consisting of solid/solid phase change materials and polymeric phase change materials; and

an outer member surrounding the inner member and forming the exterior of the fiber, wherein the outer member comprises a second polymeric material.

Claim 41 (original)

The fiber of claim 40, wherein the first polymeric material and the second polymeric material are independently selected from the group consisting of polyolefins, polyamides, polyesters, elastomeric polymers, and mixtures thereof.

Claim 42 (original)

The fiber of claim 41, wherein the first polymeric material and the second polymeric material are polyolefins independently selected from the group consisting of polyethylene, polypropylene, and mixtures thereof.

Claim 43 (currently amended)

The fiber of claim 40, wherein the inner member comprises from 10 percent to 90 percent of a total weight of the fiber ~~temperature regulating~~ material absorbs or releases heat at a temperature in the range of 5°C to 125°C.

Claim 44 (currently amended)

The fiber of claim 40, wherein the transition temperature ~~of the phase change~~ ~~regulating~~ material is ~~absorbs or releases heat at a temperature~~ in the range of 22°C to 28°C.

Claim 45 (currently amended)

The fiber of claim 40, wherein the ~~temperature regulating~~ material ~~is a phase change~~ material is selected from the group consisting of C₁₀–C₄₄ paraffinic hydrocarbons, polyethylene, polypropylene, polypropylene glycol, polytetramethylene glycol, polypropylene malonate, polyneopentyl glycol sebacate, polypentane glutarate, polyvinyl myristate, polyvinyl stearate, polyvinyl laurate, polyhexadecyl methacrylate, polyoctadecyl methacrylate, polyethylene oxides, polyethylene glycols, polyesters, and mixtures thereof.

Claim 46 (currently amended)

The fiber of claim 40, wherein the ~~temperature regulating~~ material ~~is a solid/solid~~ phase change material is a polyhydric alcohol.

Claim 47 (original)

The fiber of claim 40, wherein the inner member comprises two or more different temperature regulating materials.

Claim 48 (original)

The fiber of claim 40, wherein the inner member comprises up to 50 percent by weight of the temperature regulating material.

Claim 49 (original)

The fiber of claim 40, wherein the inner member comprises up to 25 percent by weight of the temperature regulating material.

Claim 50 (original)

The fiber of claim 40, wherein portions of the temperature regulating material are enclosed by the first polymeric material.

Claim 51 (original)

The fiber of claim 40, wherein the inner member is a single inner member defining a core within the fiber.

Claim 52 (original)

The fiber of claim 40, wherein the fiber comprises a plurality of inner members separated from each other and surrounded by the outer member.

Claim 53 (original)

The fiber of claim 40, wherein the fiber is a continuous fiber or a staple fiber.

Claim 54 (currently amended)

A core/sheath fiber comprising:

a core member positioned within and extending through substantially the length of the fiber, wherein the core member comprises a blend of a first polymeric material and a phase change temperature regulating material, wherein the first polymeric material has a partial affinity for the phase change material, such that the phase change material forms a plurality of domains dispersed within the first polymeric material; and

a sheath member forming the exterior of the fiber and surrounding the core member, wherein the sheath member comprises a second polymeric material.

Claim 55 (original)

The core/sheath fiber of claim 54, wherein the first polymeric material and the second polymeric material are independently selected from the group consisting of polyolefins, polyamides, polyesters, elastomeric polymers, and mixtures thereof.

Claim 56 (original)

The core/sheath fiber of claim 55, wherein the first polymeric material and the second polymeric material are polyolefins independently selected from the group consisting of polyethylene, polypropylene, and mixtures thereof.

Claim 57 (currently amended)

The core/sheath fiber of claim 54, wherein the ~~temperature regulating material is a phase change material~~ is selected from the group consisting of C₁₀ - C₄₄ paraffinic hydrocarbons, polyethylene oxides, polyethylene glycols, and mixtures thereof.

Claim 58 (currently amended)

The core/sheath fiber of claim 54, wherein the ~~temperature regulating material is a solid/solid-phase change material~~ has a transition temperature in the range of 22°C to 40°C.

Claim 59 (currently amended)

The core/sheath fiber of claim 54, wherein the core member comprises a blend of the first polymeric material and at least two different ~~phase change temperature regulating materials~~.

Claim 60 (currently amended)

An island-in-sea fiber comprising:

a plurality of island members positioned within and extending through substantially the length of the fiber, wherein each of the island members is separated from one another and comprises a blend of an island polymeric material and a temperature regulating material, wherein

the temperature regulating material comprises a phase change material having a transition temperature in the range of 22°C to 40°C; and

a sea member forming the exterior of the fiber and surrounding each of the island members, wherein the sea member comprises a sea polymeric material.

Claim 61 (original)

The island-in-sea fiber of claim 60, wherein the island polymeric material and the sea polymeric material are independently selected from the group consisting of polyolefins, polyamides, polyesters, elastomeric polymers, and mixtures thereof.

Claim 62 (original)

The island-in-sea fiber of claim 61, wherein the island polymeric material and the sea polymeric material are polyolefins independently selected from the group consisting of polyethylene, polypropylene, and mixtures thereof.

Claim 63 (currently amended)

The island-in-sea fiber of claim 60, wherein the temperature regulating material is a phase change material selected from the group consisting of C₁₀ - C₄₄ paraffinic hydrocarbons, polyethylene, polypropylene, polypropylene glycol, polytetramethylene glycol, polypropylene malonate, polyneopentyl glycol sebacate, polypentane glutarate, polyvinyl myristate, polyvinyl stearate, polyvinyl laurate, polyhexadecyl methacrylate, polyoctadecyl methacrylate, polyethylene oxides, polyethylene glycols, polyesters, and mixtures thereof.

Claim 64 (currently amended)

The island-in-sea fiber of claim 60, wherein the phase change temperature regulating material is a solid/solid phase change material.

Claim 65 (original)

The island-in-sea fiber of claim 60, wherein at least one island member comprises a blend of the island polymeric material and at least two different temperature regulating materials.

Claim 66 (original)

The island-in-sea fiber of claim 60, wherein at least two island members comprise different temperature regulating materials.

Claim 67 (original)

The island-in-sea fiber of claim 60, wherein at least two island members comprise different island polymeric materials.

Claims 68-92 (cancelled)